

CLAIMS

1. An air induction system for inducing airflow into the intake of an internal combustion engine having a turbocharger, said system comprising:

a clean air duct directing airflow to the inlet of the turbocharger; and

a plenum integrated with said clean air duct, said plenum located within the area directly in front of the inlet of the turbocharger, said plenum having an increased cross-sectional area relative to a cross-sectional area of a portion of said clean air duct immediately proceeding said plenum thereby reducing the velocity of the air flow immediately prior to delivery of the air flow to the turbocharger.

2. The air induction system of claim 1, wherein said clean air duct further comprises a bell-mouth transition positioned between the outlet of said plenum and the inlet of the turbocharger.

3. The air induction system of claim 2, wherein said bell-mouth has a radius ranging from approximately 3 to approximately 30% of the effective diameter of the inlet of the turbocharger.

4. The air induction system of claim 2, wherein said bell-mouth has a radius of approximately 20% of the effective diameter of the inlet of the turbocharger.

5. The air induction system of claim 1, wherein said clean air duct further comprises a diffuser in communication with said plenum, wherein said diffuser has an interior that is generally conical in shape and comprises a cone angle that establishes the expansion rate of the cross-sectional area encompassed within said diffuser.
6. The air induction system of claim 5, wherein said cone angle is in the range of approximately 4 to approximately 16 degrees.
7. The air induction system of claim 5, wherein said cone angle is approximately 12 degrees.
8. The air induction system of claim 5, wherein said clean air duct further comprises a bell-mouth transition positioned between the outlet of said plenum and the inlet of the turbocharger.
9. The air induction system of claim 8, wherein said bell-mouth transition has a radius ranging from approximately 3 to approximately 30% of the effective diameter of the inlet of the turbocharger.
10. The air induction system of claim 8, wherein said bell-mouth transition has a radius of approximately 20% of the effective diameter of the inlet of the turbocharger.

11. The air induction system of claim 8, wherein said cone angle is in the range of approximately 4 to approximately 16 degrees.
12. The air induction system of claim 8, wherein said cone angle is approximately 12 degrees.
13. The air induction system of claim 1, wherein said plenum has a cross-sectional area lowering flow velocity through said plenum to less than 75 m/s.
14. An air induction system for inducing airflow into the intake of an internal combustion engine having a turbocharger, said system comprising:
a clean air duct directing airflow to the inlet of said turbocharger; and
means for reducing the velocity of the air flow within said clean air duct in an area directly in front of the inlet of said turbocharger.
15. The air induction system of claim 14, wherein said means for reducing the velocity of the air flow within said clean air duct in an area directly in front of the inlet of said turbocharger comprises a plenum, said plenum having a cross-sectional area being greater than a cross-sectional area of a portion of said clean air duct immediately upstream of said plenum.

16. The air induction system of claim 14, wherein said clean air duct further comprises a bell-mouth transition positioned between an outlet of said means for reducing the velocity of the air flow within said clean air duct and the inlet of said turbocharger.

17. The air induction system of claim 16, wherein said bell-mouth transition has a radius ranging from approximately 3 to approximately 30% of the effective diameter of the inlet of said turbocharger.

18. The air induction system of claim 16, wherein said bell-mouth transition has a radius of approximately 20% of the effective diameter of the inlet of said turbocharger.

19. The air induction system of claim 14, wherein said clean air duct further comprises a diffuser located immediately upstream of and in communication with said means for reducing the velocity of the air flow within said clean air duct in an area directly in front of the inlet of said turbocharger, said diffuser being a conical diffuser comprising a cone angle that establishes the expansion rate of the cross-sectional area encompassed within said diffuser.

20. The air induction system of claim 19, wherein said cone angle is in the range of approximately 4 to approximately 16 degrees.

21. The air induction system of claim 19, wherein said cone angle is approximately 12 degrees.

22. The air induction system of claim 19, wherein said clean air duct further comprises a bell-mouth transition positioned between the outlet of said means for reducing the velocity of the air flow within said clean air duct and the inlet of said turbocharger.

23. The air induction system of claim 22, wherein said bell-mouth has a radius ranging from approximately 3 to approximately 30% of the effective diameter of the inlet of said turbocharger.

24. The air induction system of claim 22, wherein said bell-mouth has a radius of approximately 20% of the effective diameter of the inlet of said turbocharger.